

THE **Unexplained**

MYSTERIES OF MIND SPACE & TIME

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Mapping the heavens
Vanishing ship: the facts
Velikovsky debated
Is man a machine?

61



THE Unexplained

MYSTERIES OF MIND SPACE & TIME

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Ancient astronauts, we discuss myths and legends from many cultures that seem to hint that extra-terrestrials once visited Earth – and were worshipped as gods. The final part of **Velikovsky** reveals the extent of his success in predicting the nature of our galaxy and, lastly, **Evolution** discusses the possibility of reconciling a spiritual view of life with a belief in evolution

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Pictures in the stars

The gods, goddesses, monsters and heroes depicted in the constellation figures are usually assumed to be purely fanciful creations. In fact they were probably the systematic, practical invention of a highly scientific people. ARCHIE ROY sets out to discover who they were

ONE OF THE MOST POPULAR themes in fiction is the classic detective story: a crime having been committed, the investigator examines the scene, searches for clues, tests alibis and finally solves the mystery. The question of the origin of the constellations – the fanciful pictures that human beings have drawn in the stars – calls for detective work of a high order. Who made up the constellation figures? Where and when did they do it? And what were their motives?

Anyone looking at the stars and trying for the first time to trace out the constellations will sympathise with the exasperated remark of Sir John Herschel, the great 19th-century English astronomer, that 'the constellations seem to have been almost purposely named

The constellations of the southern skies, charted by a Dutch astronomer about 1700. The ecliptic, with the familiar constellations of the zodiac, marks the edge of the map. Along with the Ship and the Altar, the Whale and the Great Dog are the fabled Centaur and Unicorn. Most of these figures are far older than the Greeks – but those near the celestial South Pole (just below centre), such as the Chameleon and the Indian, were added much later

and delineated to cause as much confusion . . . as possible.' The charts show mythological creatures, such as giant snakes, sea monsters, and dragons, and familiar animals, such as a lion, two bears, a goat and so on. They vary widely in size, they are irregular in shape, and a great deal of imagination is required to make out the figures.

A large part of Greek mythology is represented in the sky, and it might be thought that the Greeks 'drew' them. This would be a premature conclusion, because it can easily be shown that many of the constellation figures pre-date ancient Greece, being earlier even than Homer, who lived about 1000 BC.

Literary sources do not tell us who first devised the constellations we know today. But study of their distribution in the sky can lead us towards the answer. To follow the argument it is necessary to understand something about the movements of the sky.

The movements of the stars may be described as if they are tiny lights fixed to a huge, invisible sphere. The heavens appear to revolve from east to west, making a complete revolution once every 24 hours. For an observer in the northern hemisphere, the revolution takes place around an invisible fixed point in the sky, the celestial North



Below: the Greek scientist Eudoxus wrote descriptions of the skies in the fourth century BC. Although a brilliant mathematician, Eudoxus was an indifferent astronomer: he apparently did not realise that he was handing on information that was 2000 years out of date



Constellations

Pole. To an observer in the southern hemisphere, the revolution takes place around a corresponding point called the celestial South Pole.

The apparent movement of the sky is, of course, due to the Earth's rotation from west to east. The celestial poles lie directly over the Earth's poles. The imaginary circle lying above the equator is, likewise, the celestial equator.

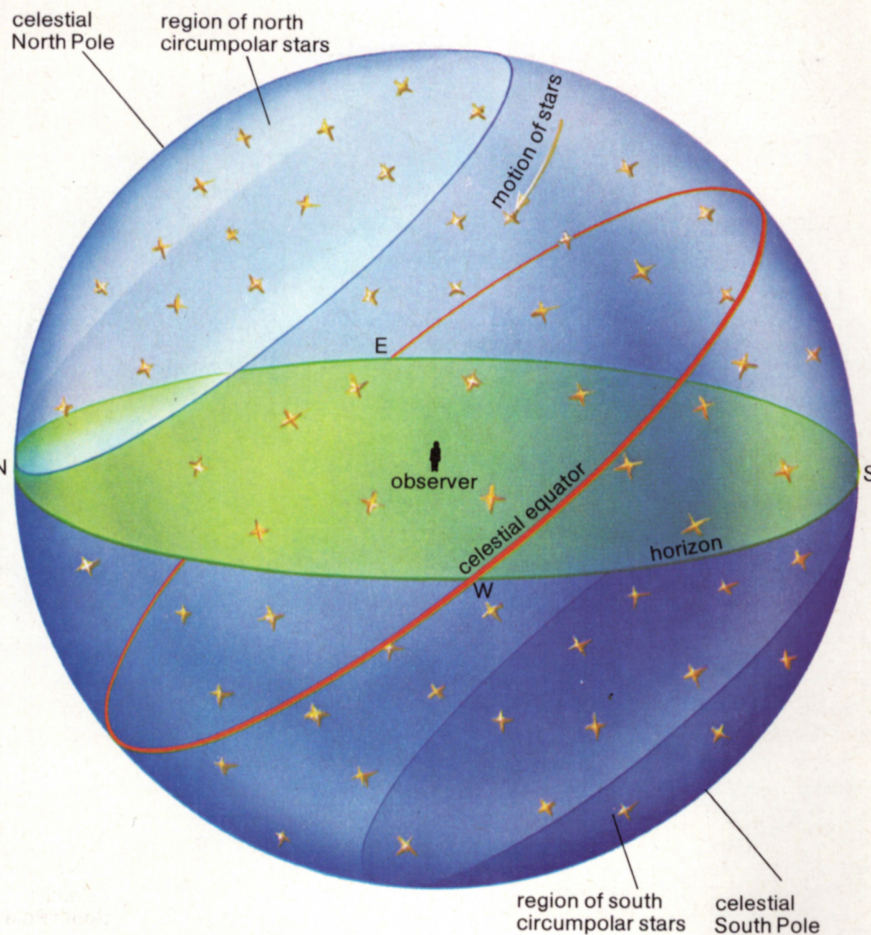
To an observer in the northern hemisphere the celestial South Pole and a region of the sky around it are never visible. The farther north he is, the less of the southern skies he can see. If he were precisely at the North Pole, he would see nothing of the sky beyond the celestial equator. Only someone on the equator will get a view, in the course of the year, of the whole of the northern and southern skies. In the rest of this article we shall assume observers to be in the middle latitudes in the northern hemisphere unless otherwise stated.

During each night, most stars rise above the eastern horizon, climb up the sky, descend and finally set on the western horizon. Night after night they make this procession.

Two groups of stars are exceptions to this, however. Some stars are so close to the celestial North Pole that they never pass below the horizon, and are visible on every clear night. These are the 'circumpolar' stars for that latitude.

The other group of stars are those that are so close to the celestial South Pole that they never rise above the horizon. They are called the south circumpolar stars for that observer's latitude.

Where does the Sun fit into this picture? Each day, of course, it shares the east-west apparent motion of the stars. But each day it 'slips' back a little in relation to them. In a year it moves right around the sky from west

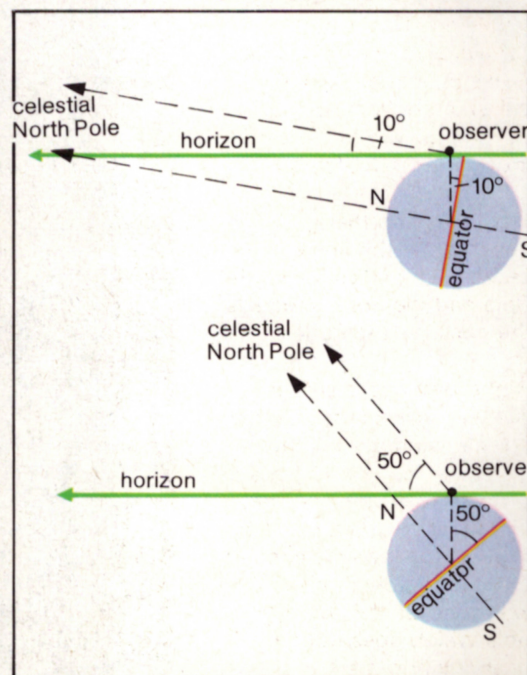


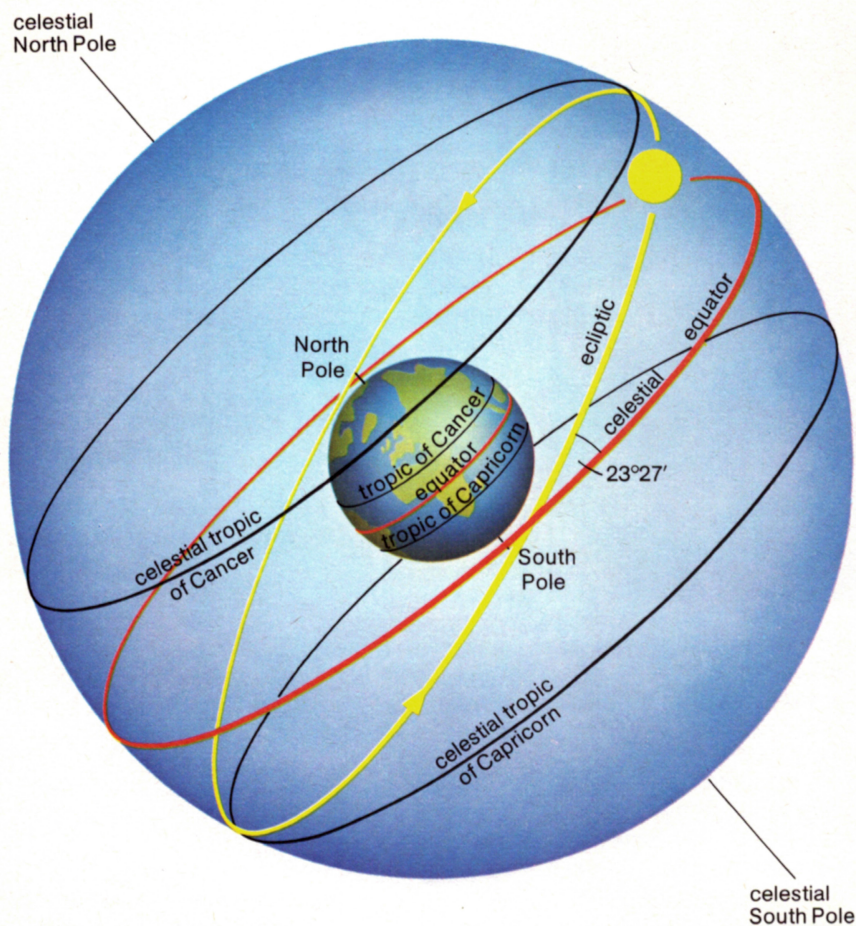
Below: the stars revolve around the celestial poles from east to west once in 24 hours. In this time-exposure photograph of the region around the celestial North Pole, each star shows up as a trail of light



to east in relation to the background of the stars. This yearly movement is a reflection of the Earth's annual rotation around the Sun.

The Sun's yearly path among the stars is called the ecliptic. It is inclined at an angle of about $23\frac{1}{2}^\circ$ to the celestial equator. The Moon and the planets make their own journeys around the sky, close to the ecliptic.





When we examine the distribution on the celestial sphere of the constellations as they were known to the Greeks, we find that some of the stars are not grouped into any of the figures. There is a patch of sky in the southern hemisphere that is bare of constellations. Yet there are stars, both bright and faint, in that area.

That there should be such a 'zone of avoidance' in the southern sky is not surprising in itself. A circular area of the sky around the celestial South Pole would be permanently invisible to astronomers of the ancient civilisations of the northern hemisphere. The radius of the area, in degrees, would in fact be equal to the observer's latitude.

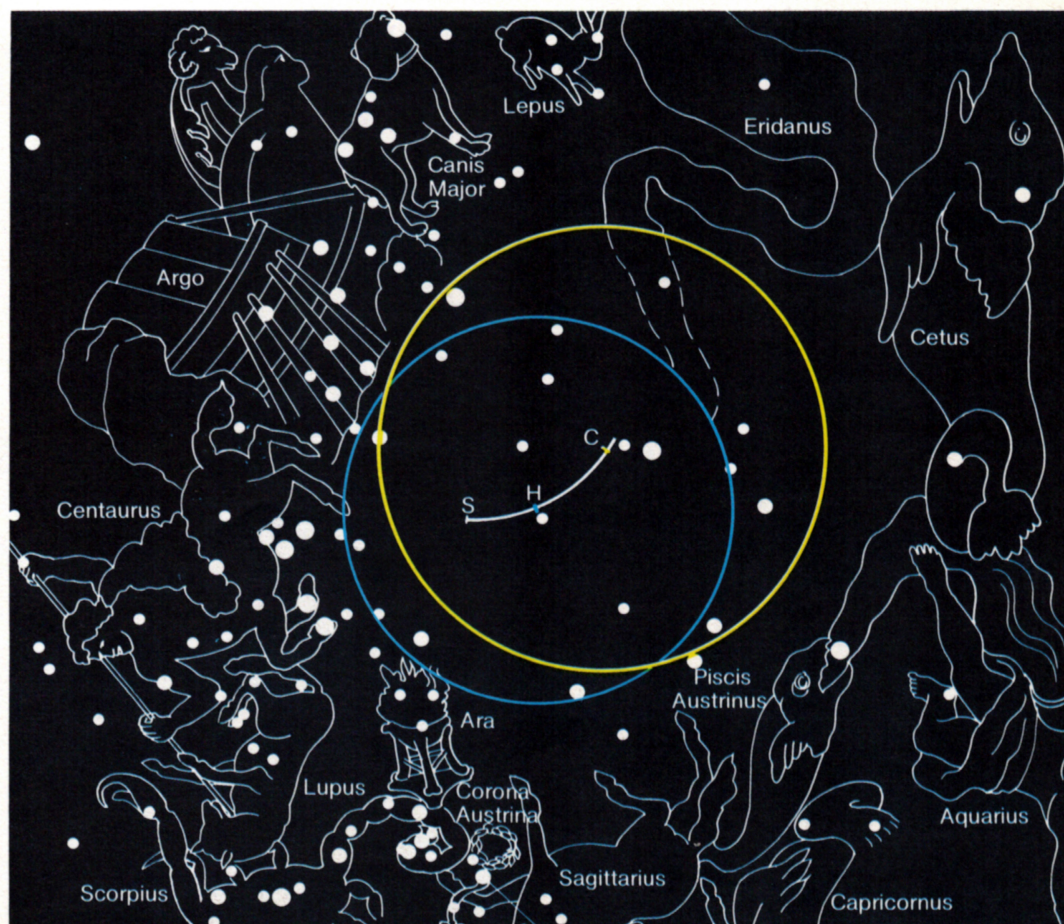
However, the area of 'missing' constellations is not circular but roughly oval, and its centre is not the celestial South Pole.

This discrepancy was already puzzling Hipparchus, one of the greatest of Greek astronomers, in the second century BC. He was comparing his own observations of the stars with the descriptions given by one of his predecessors, Eudoxus, who had died in the mid fourth century BC. He had left an astronomical globe known as the Sphere of Eudoxus; it was almost certainly a stone or metal globe on which the brighter stars, the ecliptic and equator, and the constellation figures were engraved. Eudoxus also wrote two important treatises, the *Phaenomena* ('Appearances') and the *Enoptron* ('Mirror of nature'). Both are lost, but we know exactly

The sky seems like a great sphere turning once a day, carrying the stars with it (above left). The circumpolar stars are those that either never set or never rise above the horizon. Astronomers describe the sky as if it were a fixed globe, with the Earth revolving at its centre (above). The ecliptic is the Sun's annual path; the celestial tropics mark the Sun's most northerly and most southerly positions

Left: in the northern hemisphere, the angle between the celestial North Pole and the horizon equals the observer's latitude

Right: part of the southern sky was invisible to the first constellation makers: their constellations 'avoid' an area centred on c, the celestial pole of about 2500 bc. For Hipparchus the area centred on H – the pole in his day – was invisible. S is today's pole which does not lie near any bright star



Constellations

what was in the *Phaenomena*, for it was embodied in a poem written in the third century BC by Aratus, poet at the court of the king of Macedonia.

In a commentary on Aratus's poem, Hipparchus was puzzled by the fact that it describes parts of constellations that he could not see. Furthermore, he could see stars that were begging to be incorporated into constellations but were not described by Aratus.

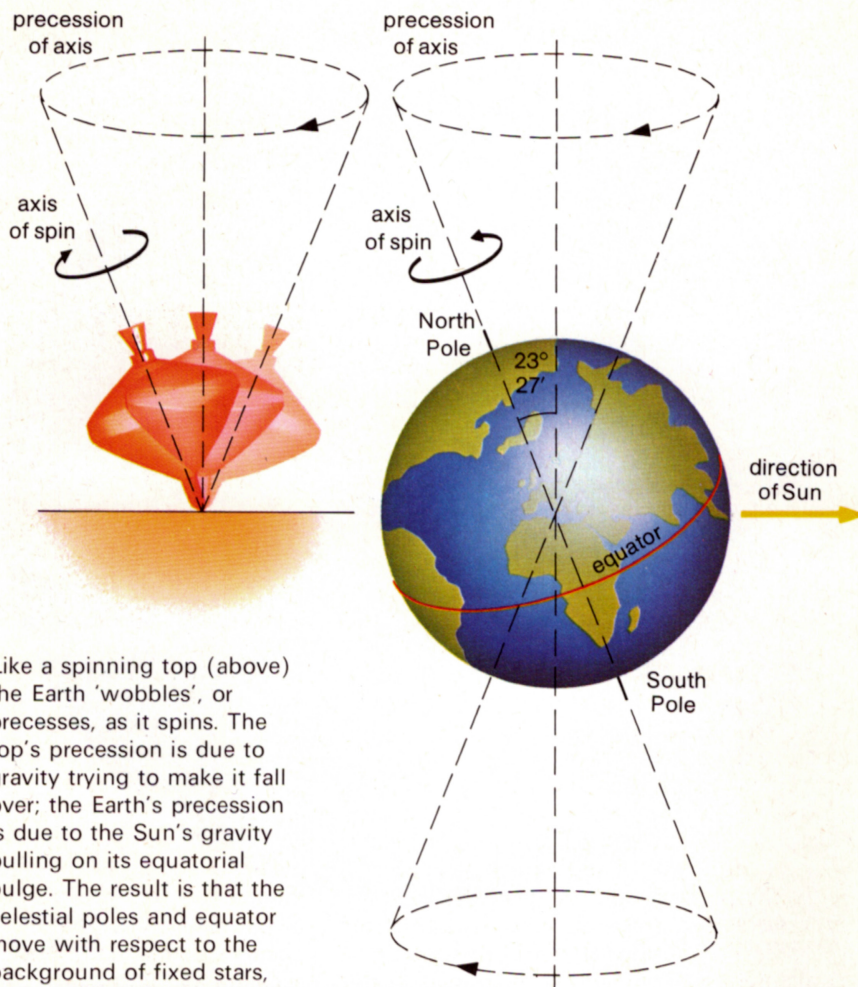
Hipparchus might well have asked himself the question: 'Is it possible that there was a time when these statements were correct, and if so, what do I have to assume about the movements of the Earth to make them so?' It is quite possible that this led Hipparchus to his most celebrated discovery: that the positions of the celestial poles are not fixed – over thousands of years they move around the sky in large circles, or 'precess'.

It takes about 26,000 years for each celestial pole to complete one such circle. It happens that today there is a fairly bright star within one degree of the north celestial pole. We call it the Pole Star, or Polaris. During this long precessional period the star patterns scarcely change at all, but at different eras astronomers and travellers will choose more suitable pole stars to indicate the approximate direction of north.

The wobbling Earth

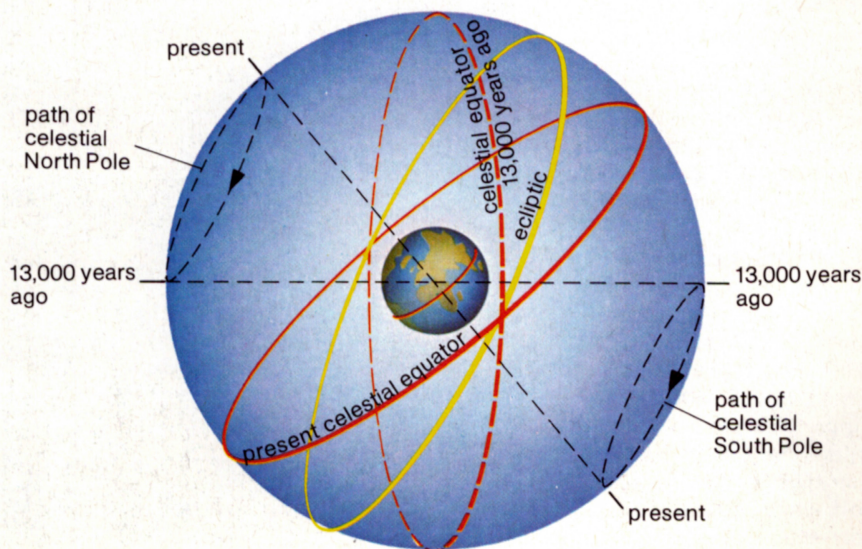
As the poles move through the sky, so the celestial equator moves as well. The positions at which it cuts the ecliptic, which is fixed, also move. These are called the equinoxes and are noteworthy because, when the Sun lies on one or other of them, exactly halfway between the celestial poles, day and night are exactly equal in length. The 'wobbling' of the Earth on its axis is called the precession of the equinoxes. It is generally assumed that Hipparchus discovered precession when he found that the positions of the stars in relation to the equinoxes had changed over the centuries. But it is highly likely that his attention was first drawn to it when he was trying to reconcile the constellations of his day with those described by Eudoxus, as related in the poem by Aratus. For it might have been then that he realised that a shift in the celestial South Pole would mean that certain stars visible in his day were invisible to the constellation makers, and that they could also see stars that were always below his southern horizon. And this led him to discover the corresponding shift in the equinoxes for which he is famous.

Whatever the truth about the genesis of Hipparchus's discovery, the constellations' zone of avoidance is valuable evidence concerning the identity of the constellation makers. In the 1920s an historian of astronomy, A. C. D. Crommelin, showed that, roughly speaking, the radius of the zone of avoidance is about 36° . This means that the people who 'drew' the early constellations lived about 36° north of the equator.



Like a spinning top (above) the Earth 'wobbles', or precesses, as it spins. The top's precession is due to gravity trying to make it fall over; the Earth's precession is due to the Sun's gravity pulling on its equatorial bulge. The result is that the celestial poles and equator move with respect to the background of fixed stars, taking nearly 26,000 years to complete one revolution (below). The nearest bright star to the celestial North Pole in 2500 BC was Thuban in the constellation of the Dragon (below right). The ancient constellation figures seem to be orientated in relation to this position rather than to the present-day pole, which lies in The Little Bear

Furthermore, the centre of the zone of avoidance lies – again very roughly – where the celestial South Pole lay at about 2500 BC. These figures are confirmed by a study made by the astronomer Michael Ovenden. By studying the orientations of the constellation figures and their distribution on the globe, he showed that they were related to the position of the celestial North Pole as it was about 2500 BC. And these figures are in good agreement with those arrived at in the early 1900s by E. W. Maunder: a latitude between



35° and 40° north and a date about 2700 BC.

Ovenden went on to study the information given by Aratus in his poem. He showed that Aratus was describing the sky as it appeared in about 2600 BC (with an uncertainty of 800 years each way). The knowledge embodied in the poem may date from the time when the constellations were devised.

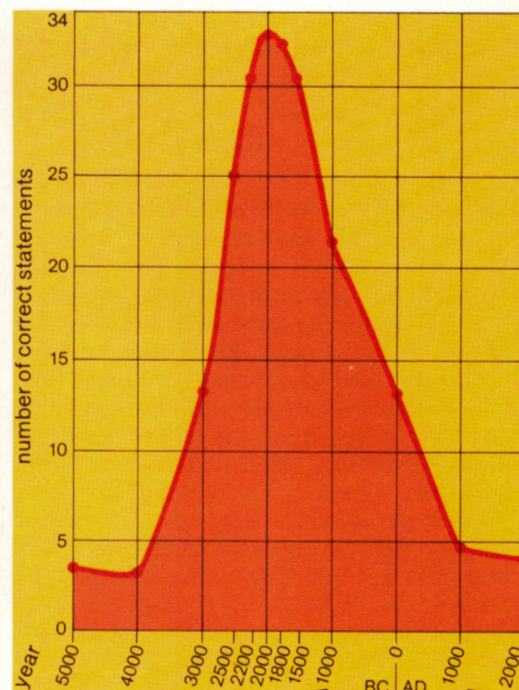
There is another way of approaching the problem of dating the constellation makers. In his poem Aratus tells us how the constellations are intersected by the celestial equator and two other imaginary circles in the sky, the celestial tropics of Cancer and Capricorn, which are both parallel to the celestial equator.

Altogether there are 34 statements in the poem about these circles and their relations to the constellations. Few of them accurately describe the present-day positions of the circles, owing to precession. However, a planetarium – an astronomical ‘time machine’ – can be used to find a date in the past at which they *would* fit the skies. In a planetarium a realistic picture of the night sky is projected onto the inside of a dome in which an audience is seated. The stars are shown as spots of light with their correct brightnesses. Their motions in the course of a day, a year or many centuries can be displayed.

In the planetarium the fit of the 34 statements was examined at selected dates from the present (actually AD 2000) to 5000 BC. A convenient way of gauging the fit was to give



In a planetarium (above), the skies can be displayed as they appear at any date and from any place. One was used to check the truth, at various dates, of 34 astronomical statements in a poem by Aratus from the third century BC. The graph (right) shows how the poem's information is most accurate for 2000 BC



a score to each statement: 0 if it was wrong, $\frac{1}{2}$ if it was roughly correct, and 1 if it was certainly correct. The graph shows the striking way in which the score rises to a maximum of 33 in 2000 BC.

Despite the large margins of uncertainty, these diverse lines of evidence suggest a period from about 2500 BC to 2000 BC, and a latitude of about 36° north. Hipparchus was trying to match what he saw in the sky with descriptions that, in the second century BC, were already millennia old.

Our detective work has established the approximate time and place at which the constellations were first drawn and named. But this is only the start of the chase. Can we now answer the other crucial questions: Who? And why?

The naïve view that the ancient constellations were the idle fancies of a primitive and pastoral people cannot be sustained. There is no doubt that a certain people created, at a definite date and for purposes as yet unknown, an array of interconnected constellations that mapped out the sky.

Eudoxus appreciated that the astronomical knowledge incorporated in the engraved globe that he described came from an earlier age (although he did not make the discovery that was staring him in the face – the wandering of the celestial poles). But he does not explain why the globe was so out of date. Did the constellation makers not notice during all those centuries that precession was destroying the accuracy of some of the information on it? Why did they not update it?

Discovering the identity and motives of the constellation makers may shed light on these questions.

Why were the sky pictures devised? What was the purpose behind them? See page 1258



When someone says he has witnessed an experiment in which a ship was made invisible, he cannot be ignored. The claim, made by Carlos Allende, has attracted wide interest for years. But just how plausible is it? PAUL BEGG sifts the evidence

THE STORY OF the Philadelphia experiment has been circulating since 1956. During that time the United States Navy has not only consistently and emphatically denied that such an experiment took place in 1943, they have maintained that the technology required for such an experiment does not exist even now. There is no evidence that any similar experiments have been conducted or that the results of any such experiments have been put into practice. The case for the Philadelphia experiment (see page 1194) therefore rests on the testimony of the ambiguous Carlos Miguel Allende (also known as Carl M. Allen) and the information he provided that can be checked.

If anyone could confirm Allende's story, that person would be Dr Franklin Reno, the scientist who allegedly perfected the application of the unified field theory; but no such person is mentioned in *Who's who*, *Who was who*, the *Dictionary of American biography*, or any reference source consulted by or on behalf of this author, and the Office of Naval Research denies all knowledge of a man by that name. The reason, according to Charles



Immaterial evidence

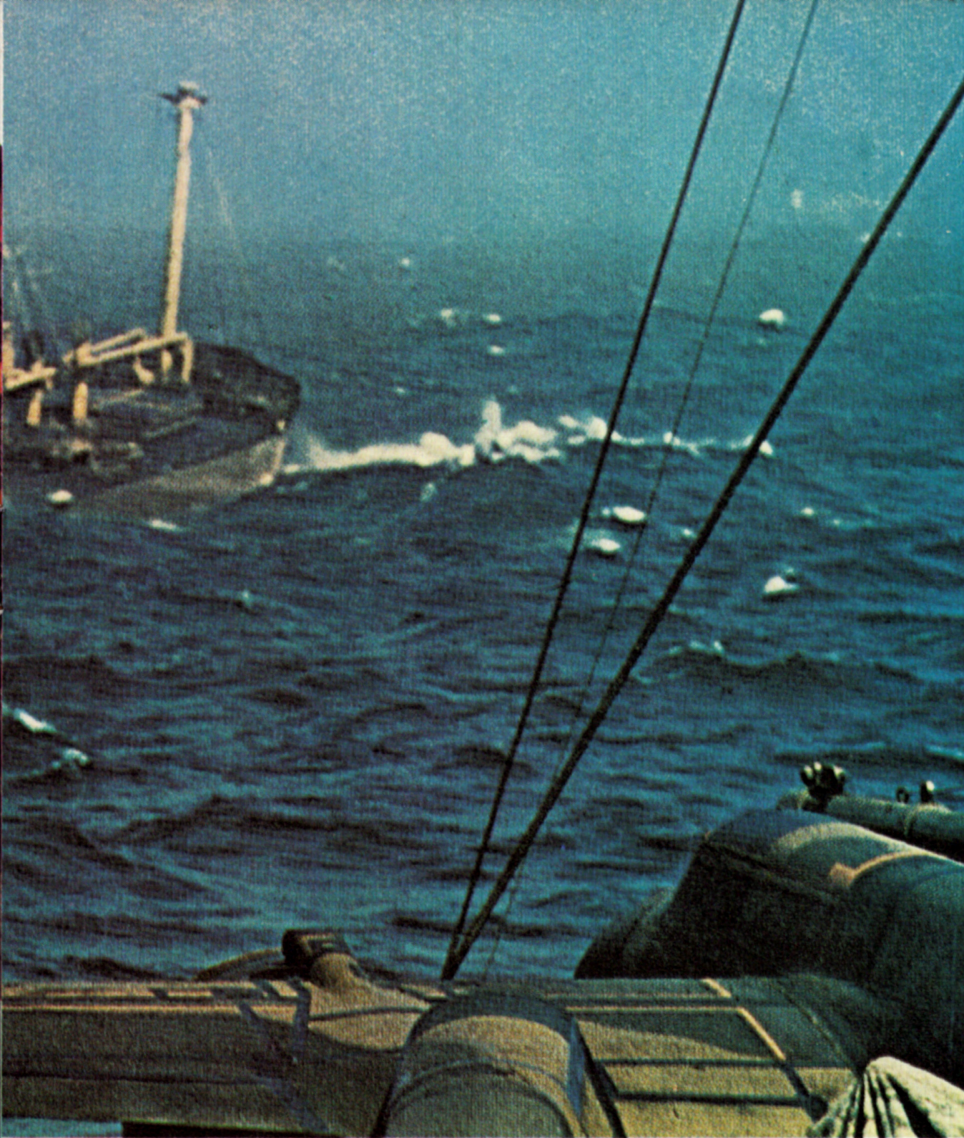
Berlitz and William Moore, is that Franklin Reno is a pseudonym.

William Moore, Berlitz's co-author of *The Philadelphia experiment*, claimed he had traced the man who called himself Franklin Reno and learned that in the 1930s Reno joined the US military/scientific establishment and rose to become a departmental head in a well-known research organisation (which Moore does not name). In 1939 and 1940 Reno was involved on the fringes of what Berlitz and Moore believe could have been the early stages of the Philadelphia experiment. This was a project allegedly suggested by Albert Einstein and Professor Rudolf Ladenberg; Reno provided some mathematical calculations for members of a top-level meeting. In later years Reno began to suspect that he knew too much for his own good and he abandoned his career, took the name Franklin Reno from a road sign to the city of Franklin and the town of Reno, and retired to a life of seclusion. 'They still watch over me, you know,' he told Moore. Reno died several months after the interview; but Berlitz and Moore do not reveal his identity

because they respected his wishes for complete anonymity and because they had 'been enjoined to be discreet by those . . . who are interested in maintaining the status quo'.

Berlitz and Moore try very hard to make something out of what Reno told them, but it seems clear that all that happened was that Reno provided figures for a discussion group considering a project using electromagnetic fields as a means of deflecting torpedoes and mines. It is not known if this project ever went beyond the discussion stage, but such a device would have been of considerable value and certainly top-secret. It is, however, far removed from invisibility and teleportation.

What Berlitz and Moore reveal about Reno himself is far less interesting than what they do not. What was Reno's real name? How did he get to know Allende? What was it that Reno felt he knew too much about for his own good? Who watched over Reno and why? Who enjoined Berlitz and Moore to 'be discreet'? What status quo were they asked to maintain? Whatever the answers to these and other questions, it must be said that Dr Franklin Reno, the principal witness in the



Philadelphia experiment

August 1943, the day on which the vessel sailed from Norfolk, Virginia, for Casablanca in Morocco. He returned to the United States on 4 October 1943 and sailed for Oran, Algeria, on 25 October. He did not return to the United States until the New Year.

It is of the utmost importance to Allende's story to prove that the *Furuseth* and the experimental ship, USS *Eldridge*, were in the same area at a time when a top-secret experiment would have been conducted. Allende claimed to have seen the experiment in October 1943 while at sea, and official records show that from 4 to 25 October the *Furuseth* was in dock and for the rest of the time was either abroad or sailing to and from foreign destinations.

Official cover-up?

According to Berlitz and Moore the deck logs of the *Eldridge* are unavailable and we must rely on the official history compiled by the Department of the Navy as the main source of information. This states that the *Eldridge* was launched on 25 July 1943 and commissioned on 27 August. From September to 28 December she 'combined escort duty with shakedown operations in the Bermuda, British West Indies, area'. This was followed by a three-day training period at Block Island and from there the *Eldridge* went to Hampton Roads, Virginia, 'to await her first overseas escort assignment'. Between 4 January 1944 and 9 May 1945 *Eldridge* made nine voyages delivering convoys to Casablanca, Bizerte and Oran. She was then transferred to the Pacific and remained there until the end of the war. She was placed out of commission on 17 June 1946 and sold to Greece on 5 January 1951.

Berlitz and Moore believe that this uneventful history has been doctored. They unearthed the engineer's log and an action report filed by the *Eldridge*'s captain, which reveal that, on 2 November 1943, *Eldridge* left Brooklyn to round up some vessels separated from convoy GUS22 by a hurricane and to escort them to their destination. The *Andrew Furuseth* was a part of convoy GUS22 and could have been escorted by *Eldridge*. Furthermore, on 20 November *Eldridge* was involved in minor action about 200 miles (320 kilometres) off the coast of Casablanca. *Eldridge*'s first overseas escort duty was not, therefore, in January 1944 but in November 1943. There was also a discrepancy as to when the ship was launched.

To claim, as do Berlitz and Moore, that these errors – if, indeed, they are errors – are 'evidence of considerable patching and doctoring' of the official report is surely overestimating their significance. Why cannot they simply be errors? If Berlitz's and Moore's own reasoning is applied to their book *The Philadelphia experiment* then their research can be seriously questioned because they, too, make errors.

defence of Allende's claims, does not corroborate the story.

In *The Philadelphia experiment* Berlitz and Moore make several errors, usually small ones such as calling the writer John Sladek 'Vincent Sladek'. They commit a major error, however, when they say that 'since the crew records of the *Furuseth* no longer exist, it is difficult to come up with anything definite regarding others who may have served on that ship with Allende.' In fact the crew records do exist. In 1976 the Department of Transportation, United States Coast Guard retrieved the records for this author from the Federal Depository. The list confirms that Carl M. Allen served aboard the SS *Andrew Furuseth* in October 1943, and so did Chief Mate Mawdesley, Richard C. Price and Patrick J. Connally – as Allende said in his letter to Morris Jessup.

As far as the writer knows, none of these men has ever come forward to confirm or refute Allende's story, nor has the *Furuseth*'s captain, William S. Dodge, nor any other member of the crew. Considerable significance could be read into their silence, but would such speculation be of any value? All this information tells us is that these men were aboard the *Furuseth*, not that they witnessed the Philadelphia experiment.

Allende signed aboard the *Furuseth* on 16

During World War II millions of tonnes of war materials and other essential supplies were carried in convoys across the Atlantic from the United States to Britain and Europe. In November 1943 the USS *Eldridge* escorted a convoy that included the SS *Andrew Furuseth*, on which Carlos Allende was serving. Could this have been when the invisibility experiment that Allende claims to have witnessed was carried out?

Philadelphia experiment

The information in the engineer's log and action report works against Allende's story rather than for it because it clearly states that on 2 November 1943, and possibly for several days beforehand, *Eldridge* was not involved in any experiments but was in Brooklyn and available for active duty. As for the possibility that the *Furuseth* was among the vessels escorted by *Eldridge*, even Berlitz and Moore admit that the US Navy is unlikely to have conducted a top-secret experiment in open seas, in full view of merchant ships and during a potentially dangerous wartime escort assignment.

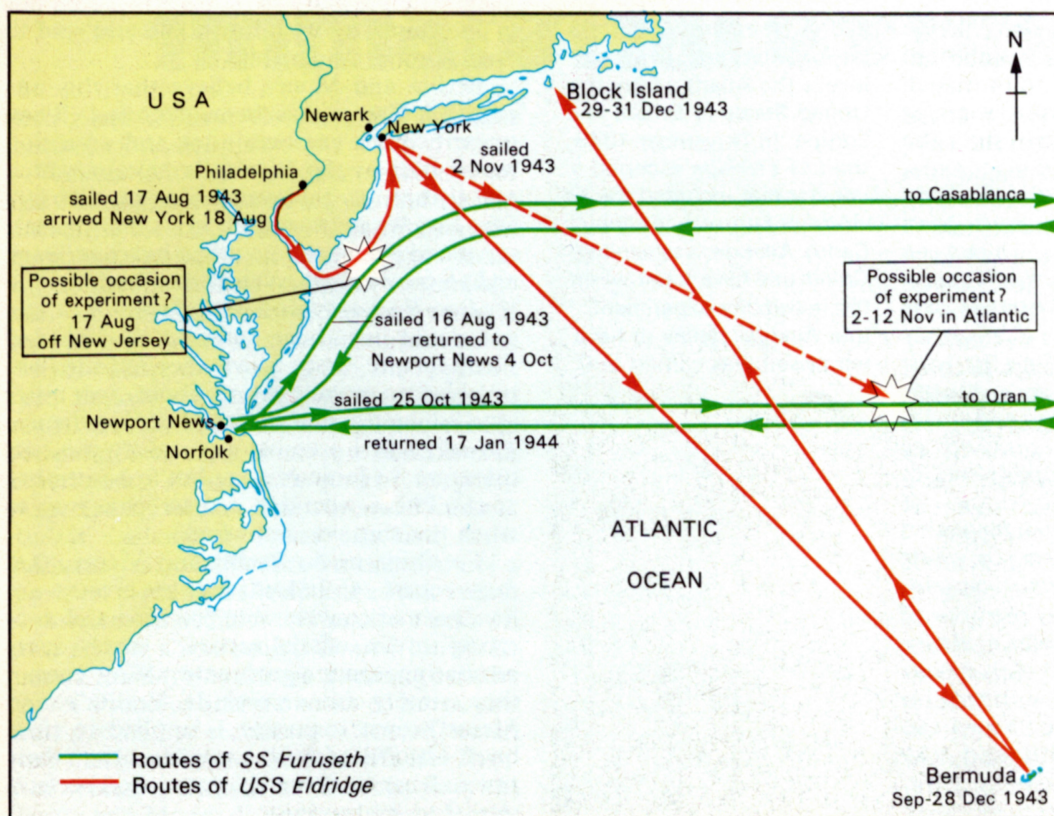
Allende's story is very much dependent on dates and places; from 4 to 25 October the *Furuseth* was in dock, and as Allende says that he witnessed the experiment while at sea, these dates can be ruled out. From 25 October the *Furuseth* was at sea, but *Eldridge* was probably in Brooklyn. And from 2 November *Eldridge* was on active duty and unlikely to have been involved with any experiment. This leaves 16 August, the day on which *Furuseth* sailed for Casablanca. Berlitz and Moore suggest that the two ships could have passed each other as *Eldridge* sailed from the Newark-Philadelphia area for Brooklyn and *Furuseth* was steaming along the coast from Norfolk prior to heading out to sea. This is a desperate long-shot, however; Allende says that he witnessed the experiment in October, not August, and there is no evidence that the vessels did pass each other. There is not a single acceptable date on which it would seem that *Eldridge* and *Furuseth* were in the same vicinity and Allende's story is seriously damaged.

Allende says he saw the experiment take place at sea in October 1943. The map shows the movements of the two vessels involved – the *Eldridge* and the *Andrew Furuseth*. The dotted line indicates a specific escort assignment undertaken by the *Eldridge* as reported in the ship's engineer's log, which Charles Berlitz and William Moore consulted. Official accounts make no mention of the incident. Berlitz and Moore say records show that the *Eldridge* left Newark for Brooklyn on 17 August 1943 and travelled via Delaware Bay, but it is much more likely that her point of departure was the port of Philadelphia

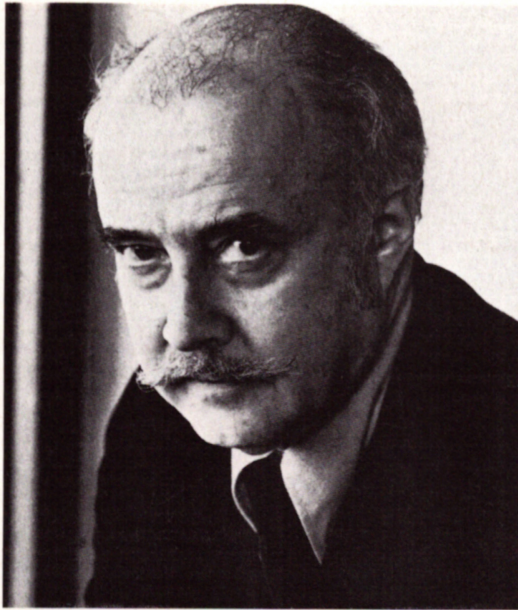
The story of the Philadelphia experiment would be strengthened if the newspaper articles referred to by Allende in his letters to Morris Jessup could be found. In their book Berlitz and Moore reproduce the following, under the heading 'Strange Circumstances Surround Tavern Brawl'.

Several city police officers responding to a call to aid members of the Navy Shore Patrol in breaking up a tavern brawl near the US Navy docks here last night got something of a surprise when they arrived on the scene to find the place empty of customers. According to a pair of very nervous waitresses, the Shore Patrol had arrived first and cleared the place out – but not before two of the sailors involved allegedly did a disappearing act. 'They just sort of vanished into thin air . . . right there,' reported one of the frightened hostesses, 'and I ain't been drinking either!' At that point, according to her account, the Shore Patrol proceeded to hustle everybody out of the place in short order.

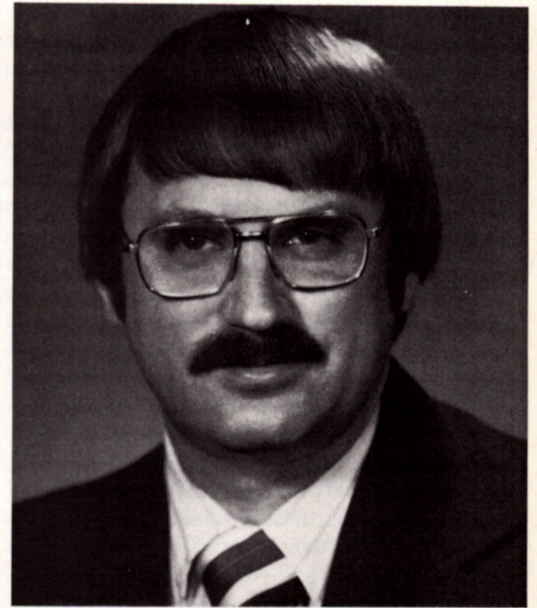
A subsequent chat with the local police precinct left no doubts as to the fact that some sort of general brawl had indeed occurred in the vicinity of the dockyards at about eleven o'clock last night, but neither confirmation nor denial of the stranger aspects of the story could be immediately obtained. One reported witness succinctly summed up the affair by dismissing it as nothing more than 'a lot of hokey from them daffy dames down there,'



Right: the naval docks at Norfolk, Virginia, during World War II. Allende claims to have read a newspaper report that said the *Eldridge* had been teleported from Philadelphia to docks in the Norfolk area and back again in a matter of minutes



Charles Berlitz (left) and William Moore (right) are two of the best-known writers to have investigated Allende's story. Their book *The Philadelphia experiment* appeared in 1979. They conclude that the 'mystery of the Philadelphia Experiment has not yet been clarified', but they seem convinced that something strange *did* happen in October 1943



who, he went on to say, were probably just looking for some free publicity.

Damage to the tavern was estimated to be in the vicinity of six hundred dollars.

Berlitz and Moore say that this article 'has managed to survive all efforts to discredit its authenticity', which is another way of saying that the cutting itself has not been proved authentic. It is, in fact, a photocopy received by Berlitz and Moore from an anonymous source. It bears neither the name of the newspaper nor the date of publication, and the column width is greater than that used by any of the Philadelphia newspapers in the 1940s.

The second article mentioned by Allende raises several questions and a number of important points. First, many accounts of the Philadelphia experiment imply that the experimental ship was teleported at the same

Further reading

Charles Berlitz and William Moore, *The Philadelphia experiment*, Panther 1979
 Morris K. Jessup, *The case for the UFO*, Citadel Press (New York) 1955
 Morris K. Jessup and Gray Barker, *The case for the UFO* (facsimile of annotated Varo edition), Saucerian Press (Virginia) 1973
 George E. Simpson and Neal R. Burger, *Thin air*, New English Library 1978

time as it was rendered invisible and that both events were witnessed by Allende. But Allende did not witness the teleportation and only knew of the incident because he read about it in a Philadelphia newspaper article. He does not know when this article appeared, but he told Jessup that it may have been in 1956, a date that must be in error because Jessup only received the letter from Allende on 13 January 1956.

Some information provided by Allende has been verified: he did serve aboard the ss *Andrew Furuseth*, so did the people he named; and the USS *Eldridge* was a real ship.

On the negative side, Jessup seems to have been paranoid and was, at best, involved in a very minor way with a project entirely different from the so-called Philadelphia experiment. There is no evidence that the *Furuseth* and *Eldridge* were in the same vicinity. With the exception of Berlitz and Moore's photocopy of questionable veracity, neither of the articles mentioned by Allende has been found. Scientific opinion is that the technology required for an experiment of the kind described by Allende does not exist.

It is frequently impossible to obtain cast-iron proof that stories such as Allende's are either true or false. It is likewise impossible for you to prove that you have not been contemplating the murder of your closest relative, but in a court of law proof must be provided by those who would make such an allegation. In Allende's case there is no more than what could at best be described as extremely weak circumstantial evidence, which does not support his claim that in 1943 the United States Navy rendered a ship invisible. The famous story of the Philadelphia experiment seems to be a hoax and should be regarded as such until somebody produces more positive proof than have Charles Berlitz, William Moore and many other writers and researchers who have been intrigued by the subject.



Psychokinetic effects are notoriously difficult to produce to order – a fact seized upon by sceptics. Yet the SORRAT group of Rolla, Missouri, have succeeded in causing a great variety of paranormal happenings. JULIAN ISAACS tells their story

THE ENVELOPE MOVED on its own slowly and jerkily from behind the typewriter. It reached the flat top of the typewriter and slid slowly across it. Suddenly it tipped over onto the keyboard – and started to become transparent. Then it vanished completely. This astonishing evidence of psychokinesis (PK) and teleportation was a highlight of one of the most extraordinary 'home movie' shows ever and, not unnaturally, those present asked their host to re-run that particular film. There had been 10 fairly primitive films shown, all shot on standard 8-millimetre film and all showing a wide range of psychokinetic – mind over matter – effects. And nearly all of them had been filmed inside a locked glass box to which only one person, the experimenter himself, their host for the

Minds over matter

evening, had the key.

In the weeks that followed, the implications of that evening's 'home movie' session slowly became apparent. If the film had shown genuinely paranormal events – and there was no evidence to prove otherwise – and if they could be reproduced by other groups elsewhere, then parapsychology was on the brink of an enormously significant breakthrough. If PK could be filmed, especially in its more exotic and rare forms, then it could be submitted to detailed study and perhaps give scientists the long-awaited foothold on understanding the elusive



physics of psychical phenomena.

Those films shown on a November evening in 1980 in Rolla, Missouri, USA, were the culmination of a long project that had begun in October 1961 with the formation of the Society for Research into Rapport and Telekinesis (SORRAT). This group is probably the USA's most successful producer of long-term, large-scale PK (called 'macro-PK' by parapsychologists).

SORRAT was founded by John G. Neihardt, professor of English literature at the University of Illinois at Columbia. A powerful, charismatic personality and a man of wide interests, he had been fascinated by the paranormal for many years. He was intrigued by the way those people with strong spiritualist beliefs or with a mystical background seemed to attract PK. Neihardt himself was a close friend of the Sioux Indian holy man Black Elk, and as a result was made an honorary member of the Oglala Sioux tribe. Some of the former members of SORRAT believe that he was actually initiated as a Sioux shaman (magician and holy man) and there are even rumours that Neihardt himself handed on this secret initiation to one of the SORRAT members.

This kind of belief may have helped the SORRAT group achieve their remarkable evidence of macro-PK; certainly some of its members were known to possess outstanding psychic gifts. The group, meeting every Friday night at Professor Neihardt's home,

Top, above and right: Dr J. T. Richards (in the striped shirt) and members of SORRAT make a light metal table rise into the air – levitated, they believe, by 'spirits'

Left: the late Professor John G. Neihardt, founder of the SORRAT group. It was rumoured that he was initiated as a Sioux shaman by his close friend, Black Elk; this magical background may have helped him to create the atmosphere of belief that apparently encourages paranormal phenomena

Right: Joseph Mangini, said to be possessed by the spirit of Black Elk during a SORRAT meeting. He is holding a *wichasha wakon*, or holy staff, and embracing Professor Neihardt's daughter Alice



Below right: a hat is levitated a few inches from a desk top

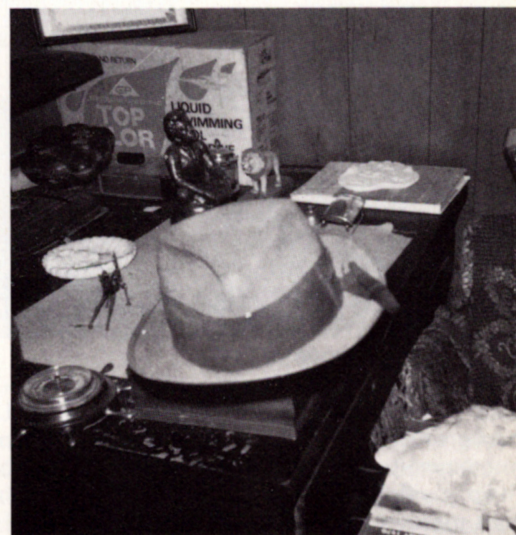
registered a drop of up to 5° in the normal room temperature. And a few months later paranormal rapping began.

These paranormal raps were crucial to the later success of the group mainly because they provided an enormous boost to its confidence and paved the way for other, more complicated, phenomena. But first the group began testing the circumstances surrounding the rapping. For example, raps were still heard when everyone in the group lay down so that their hands and feet were clearly in sight. The raps even occurred outdoors, apparently coming from underground. Indoors they would obligingly move around the room on request, the group sitting quite still meanwhile. And significantly, the raps displayed intelligence, using codes with which to answer questions, even on some later occasions conveying information that was unknown to any member who



Skyrim Farm, Missouri, grew very close over the 16 years they were together. Originally there were 30 members, but the 'regulars' consisted of 15 to 20 of the more strongly motivated.

The techniques used by SORRAT to induce psychokinetic events were similar to those used by many Spiritualist development circles. Essentially they simply sat around in a group in a carefree and light-hearted manner while waiting for PK to occur. One member of the group, Mr Joseph Mangini, developed the ability to go into a trance – and then PK phenomena were often particularly strong. After meetings had continued for only two months it was found that areas of seemingly paranormal coldness would develop around small target objects laid out on a table top. Thermometers placed near these objects



was present. So the raps, simple or complex, provided audible evidence that the group was getting somewhere and they created a sense of expectancy and excitement. What would happen next?

Apart from the positive psychological effects, the raps also served a practical purpose. They opened up a two-way channel of communication between whatever was causing them (called 'the agency' – a deliberately neutral term chosen by William E. Cox, later the group's scientific collaborator) and the group itself. The group used the raps as a code, 'agreeing' with the agency that one, two or three raps would mean 'yes', 'no', and 'maybe' respectively. In this way the group held simple question and answer sessions. The agency could also deliver messages using an alphabetic code – one rap for A, two for B and so on. Once established, this was then used by the group to ask the agency to perform certain PK tasks, which could then be graded.

Groups who aim to achieve macro-PK need to increase the level of difficulty of the tasks they set the agency only gradually – in





The SORRAT 'spirits' produced a spectacular variety of PK phenomena, which began with paranormal rapping and went on to include a host of levitations (above right and far right) and a 'walking' table (above and right). On another occasion the group managed to levitate a table without touching it (below), and once a tray rose unaided 15 feet (4.5 metres) into the air. The 'Philip' group of Toronto also had a 'walking' table – a star attraction of the Canadian television programme made about Philip – which climbed the steps to the platform on which the group were sitting



this way they are less likely to fail. And SORRAT found one of the advantages of communication with the agency was that it could refuse to do a task it considered too hard. In this way the number of tasks failed was small, helping to maintain a positive interest in the group. Another advantage of communicating with the PK agency was that the group could give it orders, which were obeyed, proving that it was the group, not the agency, that was in control.

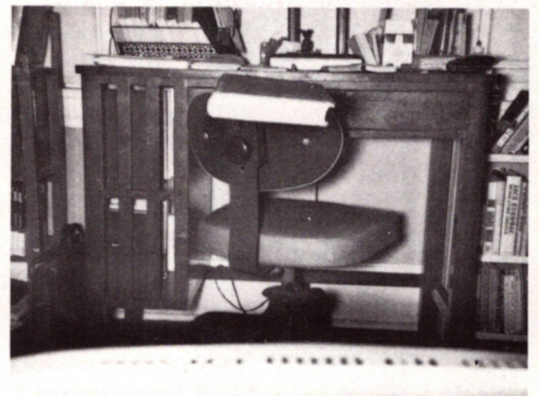
One of the most important aspects of the raps was that the agency causing them claimed to consist of a group of spirits. This interpretation was readily accepted by many members of SORRAT who were Spiritualists. From the experimenters' points of view this was a great advantage because these people did not feel personally responsible for trying to make anything happen. And conscious effort – straining to make PK occur – has been proved many times, especially in paranormal metal bending, to be counter-productive, apparently actually preventing it happening.

But the identity of the PK agency remained unclear because, although parapsychologists tend to adopt the humanistic viewpoint – preferring to believe that psychical effects are due to the living rather than the dead – the SORRAT 'spirits' later made rather eloquent and striking claims for their independent existence (see page 1250). The group's PK effects gradually became so strong that by

late 1965 a small oak table was successfully levitated. Encouraged, they then actually levitated a much more massive table weighing 82 pounds (37 kilograms). Then switching to a light metal tray as their PK target, they managed to levitate it without even touching it. Other highlights of this period included the tray remaining in mid-air for a full three minutes, and its 15-foot (4.5-metre) levitation in the open air.

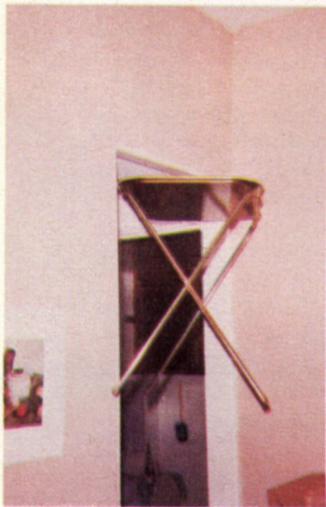
The SORRAT scrapbooks, kept by Dr J. T. Richards, the group's archivist and photographer, contain many photographs of a host of other objects being affected by psychokinetic forces. And apart from PK, the group induced other psychic phenomena that were, as far as possible, recorded by Dr Richards – such as mysterious lights, apports, teleportation of objects and, on one celebrated occasion, the appearance of a remarkably life-like full-form apparition on the lawn (which obligingly waited to be photographed). Dr Richards modestly estimates that only one in three of SORRAT's attempts to create PK effects succeeded fully, but these successes were often spectacular compared to the weak PK usually achieved in laboratory experiments.

For many years Professor Neihardt had kept in touch with Dr J. B. Rhine (regarded by some as the father of modern parapsychology) and naturally Dr Rhine was fascinated by the reports of SORRAT's phenomenal successes. Rhine enlisted the help of



his laboratory's PK specialist William Cox, who, apart from being an original and inventive experimenter, also happened to be an experienced stage magician. Rhine believed he would be invaluable in developing some kind of fraud-proof device inside which SORRAT's PK could be encouraged to take place. A locked box of some sort seemed the obvious answer – in other words a miniature PK laboratory, or minilab.

The prototype minilab, constructed by Professor Neihardt, was a huge glass container, but effects in it were very rare and limited. Cox adapted the idea, making smaller versions out of shallow wooden boxes, which were later called coffee boxes because in the experiments a layer of dried coffee grounds would usually be spread on





the box floor. The joints of each box and the seal on its glass lid were constructed in such a way that the box could not be opened without the special markers that had been incorporated into the joints when they were made. After every experiment, each box was taken apart and its seal examined for signs of tampering. None was ever found.

For the experiments, a variety of objects would be placed in the box, and a layer of coffee grounds would be spread on the box floor. Then the agency would be set a specific task. For example, one task consisted of moving one of a pair of dice through the coffee grounds, while leaving the other where it was. The task was specifically devised to prevent the effects being achieved simply by the box tilting – deliberately or accidentally – which would have made both dice move. This particular test was often successful, sometimes providing the added bonus of the moving dice leaving a broken trail, as if it had hopped across the coffee grounds. The only conclusion was that the dice had actually levitated from place to place.

Sometimes only coffee grounds were placed in the box, and the agency was given the task of producing visible trails in the grounds, exposing the white floor of the box.



Top and above: dice (ringed), moved only by PK, plough a path through a layer of coffee grounds on the floor of a shallow box, exposing the light-coloured timber beneath. Other dice trails were broken – as if the dice had hopped

Below: while in a trance, SORRAT member Joseph Mangini lightly touches a table as it 'walks' up the wall



Other boxes had no coffee grounds and were equipped with a sheet of carbon paper and a stylus. The agency caused the stylus to write by itself – by pressing down on the carbon paper and leaving scrawls on the white floor. 'Direct writing' (as writing by PK alone became known) resulted in various sorts of communications: sometimes mere scrawls, sometimes whole words, would be written – forerunners of the much more elaborate and coherent messages left in the later minilabs (see page 1250).

In 1977 Cox retired from Rhine's laboratory and devoted himself to the intensive study of the SORRAT PK. He took the opportunity to test the coffee boxes while actually

at Skyrim, and made the momentous discovery that PK effects would occur spontaneously, while no one was trying to produce them or, as far as anyone knew, even thinking about them. This totally disproved the common idea that PK requires massive concentration and effort. And the fact that the coffee boxes could be left alone and *still produce PK* was to be exploited in later minilab experiments with astonishing results. It is the phenomenon of spontaneous PK more than anything else that makes the work of the SORRAT group so important.

This preliminary research convinced Cox that SORRAT's effects were genuine. But with the death of Professor Neihardt in 1973 the group began to lose its impetus. However, two SORRAT members, Joseph Mangini and Dr Richards, had already begun to experience spontaneous PK of various sorts as individuals.

Cox settled in Rolla specifically to study PK in the Richards's home. The results of this collaboration have provoked amazement and disbelief among many professional parapsychologists for whom they are simply too good to be true. But despite the criticism and incredulity, the paranormal events at Dr Richards's home were soon to become too astonishing to be ignored.

How a fish tank became a minilab – and PK history was made. See page 1250

Nothing but machines?

The theory of neo-Darwinism is regarded by many scientists almost as an article of faith. But, argues RUPERT SHELDRAKE, it is by no means certain that it can explain the sheer diversity of living things on Earth

LIKE DARWIN'S ORIGINAL THEORY of evolution, the neo-Darwinian theory currently accepted by scientists attributes an essential role to natural selection. This principle in itself is obvious enough: it simply states that organisms vary and that the variations tend to be inherited by their offspring; that organisms generally produce more offspring than can possibly survive; and that the offspring best adapted to their environment will usually be the ones that survive to reproduce. Thus natural selection ensures that favourable variations will tend to accumulate in the population.

Darwin himself believed that, whereas some hereditary variations are due to chance, others are due to adaptations acquired by ancestors in response to their environments. For example, plants grown in hot, dry places generally develop thicker leaves than plants of the same species grown in cooler and moister conditions, and intelligent animals placed in new environments develop new habits appropriate to their circumstances. Darwin considered that such acquired characteristics could be inherited, and he even thought up an elaborate theory, which he called the theory of pangenesis, to explain how this might happen. He suggested that small particles from all over the body moved into the egg and sperm cells, modifying them in accordance with the structures and habits the organisms had acquired. This theory was subsequently proved wrong.

Nevertheless, if acquired characteristics are not inherited, it is difficult to understand why many features of living organisms have developed. Camels, for example, have pads of thickened skin on their knees. It is easy to see how they are acquired in response to the abrasion of the skin as the animals kneel down. But baby camels are born with them.

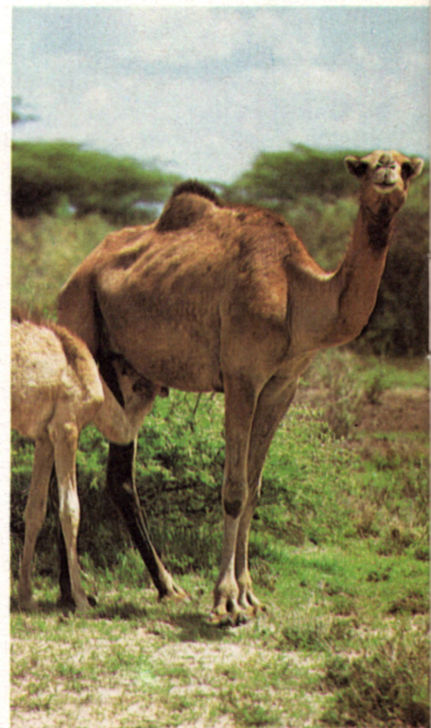
The neo-Darwinian theory differs from Darwin's in that it takes into account the theories of genetics, a science Darwin knew nothing of. (Gregor Mendel conducted his pioneering experiments in genetics in 1865, but his results remained unknown until 1900. Charles Darwin died in 1882.) According to genetics, inheritance can be explained in terms of genes, made up of the chemical DNA and strung together in long thread-like chromosomes within the nuclei of cells (see



page 1142). The genes in the sex cells are not changed by alterations in other parts of the body that occur in response to the conditions of life. Because the inheritance of acquired characteristics cannot be understood in terms of genetics, its very possibility is denied by neo-Darwinians, on theoretical grounds.

The hereditary differences between organisms are explained by neo-Darwinians in terms of random, accidental changes in the genes, called genetic mutations. Thus, according to this theory, camels are born with pads on their knees not because of the inheritance of this characteristic as a result of the habit of kneeling, but because of random mutations that just happened to give rise to pads in the right places. The only other source of hereditary variation admitted by this orthodox view is the random shuffling of genes produced by the two parents in the process of sexual reproduction.

In summary, neo-Darwinism states that evolutionary creativity depends on nothing but blind chance, combined with the necessities imposed on organisms by natural selection. There is no plan or direction to the





Left: an artist's impression of the landscape of the Earth as it cooled after the 'big bang'. Life probably evolved in a 'primordial broth' containing amino acids formed from the atmospheric gases by flashes of lightning. But does this really mean that all living creatures are nothing more than complex chemical structures?

Far left: a fox scavenges from an overturned dustbin in a town habitat. Can it really be, as neo-Darwinists claim, that the programme for such intelligent adaptation is encoded in the genes?

Below left: Arabian camels. Adult camels have hard pads on their knees. It is easy enough to suppose that they might have arisen through abrasion as the camels knelt down – but baby camels are born with them. If, as neo-Darwinists believe, acquired characteristics cannot be inherited, how can this be?

Below: in an astonishing camouflage manoeuvre, the butterflies on the right mimic those on the left. In many cases, the mimicked species is distasteful to the mimics' predators

process of evolution, and living beings, including human beings, have no ultimate purpose except to survive and reproduce.

The evangelists of neo-Darwinism usually present their theory as if it were an established scientific fact that any rational person is bound to accept, whether he or she likes it or not. However, this is far from being the case, for four main reasons.

First, although natural selection will undoubtedly filter out organisms that are poorly adapted to their environment, and so will tend to lead to the development of locally adapted races *within* species, there is no evidence that fundamentally new types of organism develop gradually through the selection of small variations. For example, we cannot ascertain from the fossil record how complex structures such as the eyes of vertebrate animals or the feathers of birds originated. They could just as well have appeared by sudden jumps as by a long-continued process of gradual modification. Darwin and his followers prefer the idea of gradual changes because they wish to avoid anything that might seem miraculous (see page 1161). But this is nothing more than intellectual prejudice, and armchair speculations about hypothetical missing links do not prove anything one way or another.

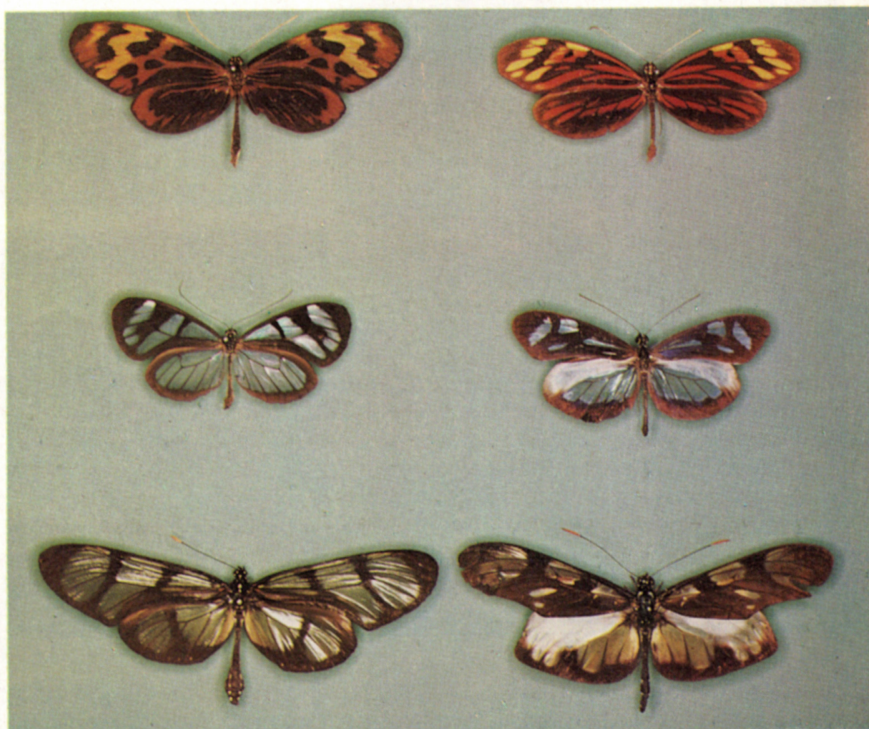
Secondly, if the origin of species has occurred gradually under the influence of natural selection, the characteristics of the species should be specifically adapted to the conditions of life. But many features of animals and plants seem to exist for no

particular reason. In the plant kingdom, for example, species with many different kinds of leaves and flowers seem to survive equally well in the same environment; so how could similar selection pressures have given rise to such widely different forms? In a detailed study of a family of tropical water snails, the *Podostemaceae*, the eminent botanist J. C. Willis concluded that, although an enormous variety of forms was shown by the different species, 'there was no evidence to be found that would show that natural selection had anything to do with the multiplicity of form in these plants, for all were growing under the same conditions.' This led him to remark that 'it would almost seem as if, in cases like this, if not perhaps in most, evolution must go on, whether there be any adaptational reason for it or not.'

Thirdly, the genetic theory provides an inadequate explanation of heredity. It takes no account of the results of experiments that show that organisms may develop under influences from previous members of their species, influences that are transmitted directly through morphogenetic fields (see page 1142). If they do in fact draw on a sort of pooled 'species memory', then acquired characteristics could indeed be inherited without the need for modification of the genetic chemical, DNA. Thus, for example, animals could 'tune in' to the experience of previous animals and benefit from it.

Lastly, neo-Darwinism depends on a very questionable theory of the nature of life, the mechanistic theory. This is based on the assumption that living organisms are nothing but complex machines, governed only by the known laws of chemistry and physics.

It is because of this assumption that most biologists reject the existence of telepathy,



Evolution

precognition, psychokinesis, and indeed the whole range of the so-called paranormal. This refusal is not based on an examination of the facts, but merely on the grounds that because these things cannot at present be explained, they cannot possibly happen.

There is, of course, no reason to suppose that we already know all the fundamental laws of matter and energy; quite apart from the existence of so many unexplained phenomena, the continued existence of scientific research itself indicates that we do not. If the hypothesis of morphogenetic fields could be confirmed by experiment, it would involve the discovery of a new set of laws providing connections between things across space and time – laws that have not yet been recognised by science. And still more laws may be discovered in the future, whose existence has not so far even been suspected.

The mechanistic theory of life is founded on an analogy between living organisms and machines; for example, the eye is compared



Above: a shore crab that has lost a pincer grows a new one. Orthodox science has not yet come up with an explanation of how this regeneration is possible

Left: a peacock with its magnificent tail fanned out as part of the courtship ritual. How would 'survival of the fittest' result in such unnecessarily complex forms?

Below: the elegant 'zip-fastener' structure of a bird's feather, which is designed to provide the bird with a waterproof coat. Did it evolve gradually, as the neo-Darwinists believe, or could it have appeared by a sudden jump at some point in their history?

to a camera, and the brain to a computer. Such similarities do indeed exist, but they do not prove that living organisms are *nothing but* machines.

Both living organisms and machines are purposeful. But the purposes of machines are given them by the human beings who design them; for example, the functions computers perform depend on the way they are designed and programmed. But what designs and programmes living organisms? Mechanists reply that nothing does: it all happens as a result of chance mutations and natural selection. But this is a circular argument: the neo-Darwinian theory of evolution depends on assuming that the machine theory of life is correct, and this theory can be justified only in terms of the neo-Darwinian theory of evolution.

The most important argument mechanists use to justify their position is to state that, since living organisms are made up of identifiable chemicals and obey the known laws of physics, they cannot involve any principles that science has not already discovered. The



easiest way to see the flaw in this reasoning is to consider the mechanistic theory of the origin of life.

It is generally thought that the first living cells appeared over two and a half thousand million years ago in a 'primordial broth' containing organic chemicals, such as amino acids, formed from gases in the atmosphere by flashes of lightning (see page 170). This is fairly plausible, but of course we can never know for sure what happened in the remote past. There will always be a possibility that life originated somewhere else in the Universe, and that the Earth was 'seeded' with primitive organisms that came – or were deliberately sent – from outside.

However, let us assume for the purposes of argument that the first cells arose from originally non-living aggregates of chemicals. Now mechanists assert that this shows that there is nothing in life that is not already present in non-living matter. They often claim, in addition, that it should eventually

Below: honey bees at work in a hive. Individual bees instinctively act for the good of the hive even if, by doing so, they endanger their own lives. Can this behaviour be explained in terms of the mechanistic view of life favoured by the neo-Darwinists?

Bottom: a tiger resting in long grass. Camouflage colouring can be extremely effective, and it is plausible to argue that it must have arisen through the process of natural selection in response to environmental pressures. But can this kind of argument be extended to include *all* characteristics of living things?



be possible to make living organisms artificially from chemicals in a test-tube, and that this would prove that they are nothing but complicated chemical systems.

To see the fallacy in this, consider the analogy of a transistor radio. The set is made up of wires, transistors and so on, and contains a battery with chemicals inside it. Before all these different components were assembled, they did not function as a radio, picking up radio signals and turning them into sounds. But after they have been put together in the right way, they do so. The chemical composition of the parts does not change when they are wired up together in the set, nor does the set gain weight when it is picking up transmissions. But this does not mean that the set can be explained in terms of



the chemistry of its components alone. Likewise, the fact that living organisms are made up of chemicals, and may have originated from non-living components in the first place, does not prove that they can be understood merely in terms of chemistry.

Now imagine someone who refused to believe this. He might try to prove his point by building a replica of a set from parts he had made himself using simple raw materials. When he succeeded in doing this, and found that it worked just like the original, he might regard this as a conclusive demonstration that it involved nothing but the parts he had put together. Nevertheless, in spite of his technical achievement, he would still not know anything about radio waves. Similarly, even if living organisms were ever to be synthesised artificially, this would not prove that they were nothing but chemical systems.

Continuing mysteries

Apart from the logical flaws, the most serious defect of the mechanistic theory is that it has failed to lead to an understanding of the central problems of biology. After decades of intensive research, it is still not known how animals and plants manage to take up the forms characteristic of their species – think of an orchid, a peacock, or a tiger – starting from egg cells. Nor is it understood how they are able to regenerate after damage: a flat-worm, for example, can be cut up into several pieces, each of which will grow into a complete worm. And the instincts of animals – the behaviour of ants, for example (see page 726) – has continued to be inexplicable in mechanistic terms, despite extensive research.

Mechanists concede that these phenomena cannot be explained in terms of physics and chemistry at present, but they say that this is only because they are so complicated. They assert that it will be possible to explain them mechanistically at some time in the future. But this is not a scientific argument based on evidence; it is nothing more than a statement of faith in the mechanistic creed.

Thus, while the neo-Darwinian theory seems to be based on well-established facts, with all the authority of objective science behind it, on closer examination it turns out to be nothing of the sort. Indeed, behind its scientific façade, it appears to have become for many of its followers remarkably like a religion. This seems to be the reason why they propagate their dogmas so zealously, guard against heresies so vigilantly, and deny the truth of all other faiths so vehemently. Nevertheless, it is perfectly possible to accept the idea of evolution without having to believe the neo-Darwinian doctrine. Evolution may not be blind and purposeless – and the amazing creativity of the living world may have more behind it than mere chance.

What are the alternatives to the neo-Darwinian theory of evolution? See page 1230.

Catastrophe and controversy

Velikovsky's work was greeted with derision by his opponents; his theory of 'cataclysmic evolution' was dismissed as proof of his intellectual irresponsibility. But, as COLIN WILSON reports, modern research supports many of his most startling conclusions

THE STORY OF THE PUBLICATION of Velikovsky's *Worlds in collision* – and the subsequent attempts to suppress it – is one of the sorriest chapters in the history of ideas. In his book *Scientists confront Velikovsky*, the sociologist Norman Storer does his best to excuse the attitude of the scientists. He points out that 1950 was in many ways a bad year, with the Cold War at its chilliest, and reactionary forces – exemplified by Senator Joe McCarthy's 'non-American activities' campaign – steadily gathering strength. Storer pleads disarmingly for the scientists:

If we add to this the fact that Velikovsky could be only marginally distinguished from the myriad of eccentrics who have always assailed science, perhaps the initial response to his work can be understood.

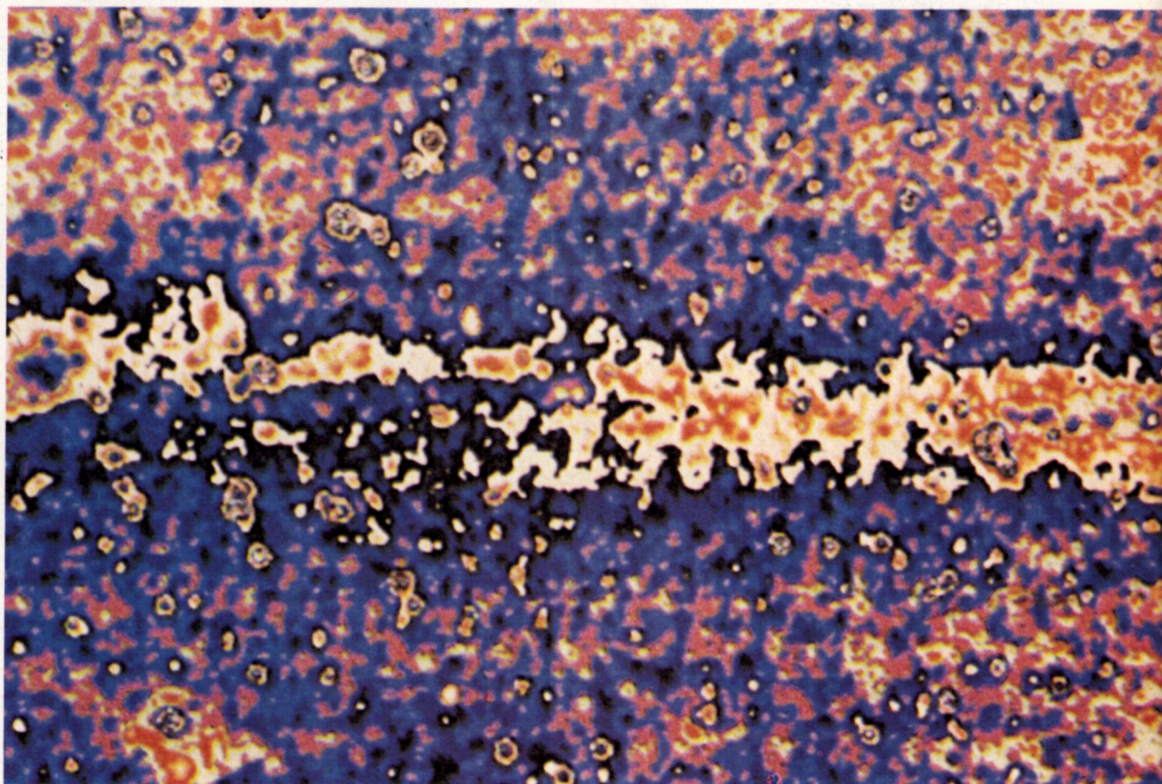
Plausible as this is, however, it fails to explain the gibbering rage with which respected scientists greeted the book, or their determined efforts to suppress it. It is no excuse to say that the scientific community

was itself a little paranoid at the time.

To be fair, it is true that Velikovsky's basic thesis *sounds* lunatic. He is asking us to believe that, sometime before 1500 BC, a comet erupted out of Jupiter. As far as we know, comets do *not* erupt out of planets. He is asking us to believe that this comet came close to the Earth at the time Moses was trying to persuade Pharaoh to let the Israelites out of Egypt and that, as the Earth passed through the comet's tail, Egypt was smitten with the plagues described in the Bible – falling blood, locusts and so on, and the death of all the firstborn. He is asking us to believe that, as the centre of the comet came closer to the Earth, the waters of the Red Sea rose until the two bodies met, when there was an almighty electrical discharge and the waters fell again – conveniently for the Israelites, who walked across the Red Sea dry-shod when the waters were sucked back, while the pursuing Egyptians were drowned when the waters were released again. Life on Earth might have become extinct were it not for the fact that the comet also dropped a kind of food in the form of carbohydrates – manna – that kept the survivors alive. Fifty years later, the comet returned just as Joshua was leading the Israelites into the Promised Land, and the walls of Jericho collapsed in the resultant earthquake.

Most reasonable people feel that Velikovsky's hypotheses go too far. In a sense, Velikovsky is a true Freudian in that

Right: a computer-enhanced photograph of the 3-million-mile (5-million-kilometre) tail of Comet Kohoutek, taken by *Skylab* in 1973. Velikovsky believed that the catastrophes described in the Bible – such as the plagues that afflicted Egypt (above right) – occurred when the Earth passed through the tail of a comet that later became the planet Venus

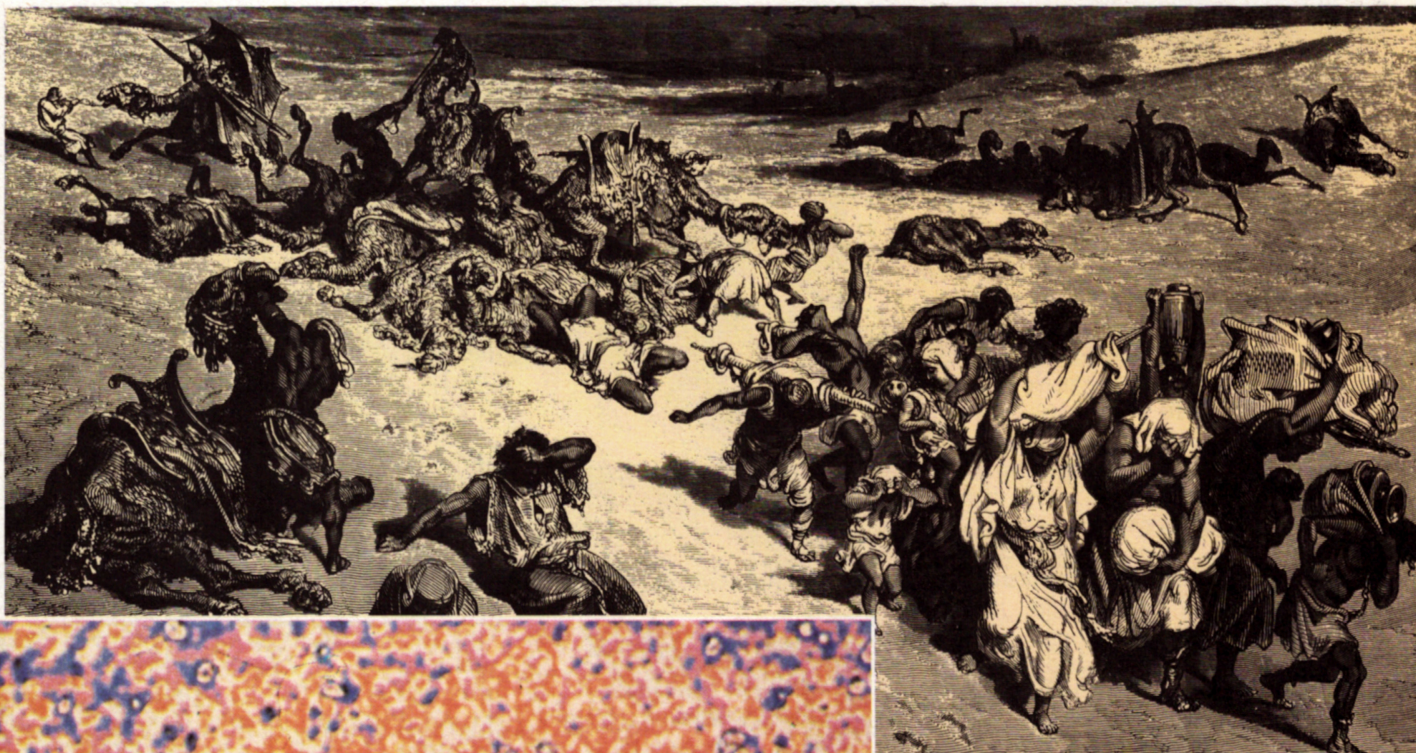


he cannot resist seeing all the facts he comes across in terms of his theory – as Freud, for example, saw just about every genius in history as an illustration of the Oedipus complex. But the fact remains that Velikovsky has presented a case to be answered.

While the controversy over *Worlds in collision* was still raging, Velikovsky moved from New York to Princeton, and began to spend his days in the library of the Princeton Department of Geology. He was studying the material on tremendous convulsions that have distorted the surface of our Earth at remote epochs in the past. In doing so, he was aware that he was reviving a theory that had been discredited in the 19th century. It was called catastrophism, and it was an

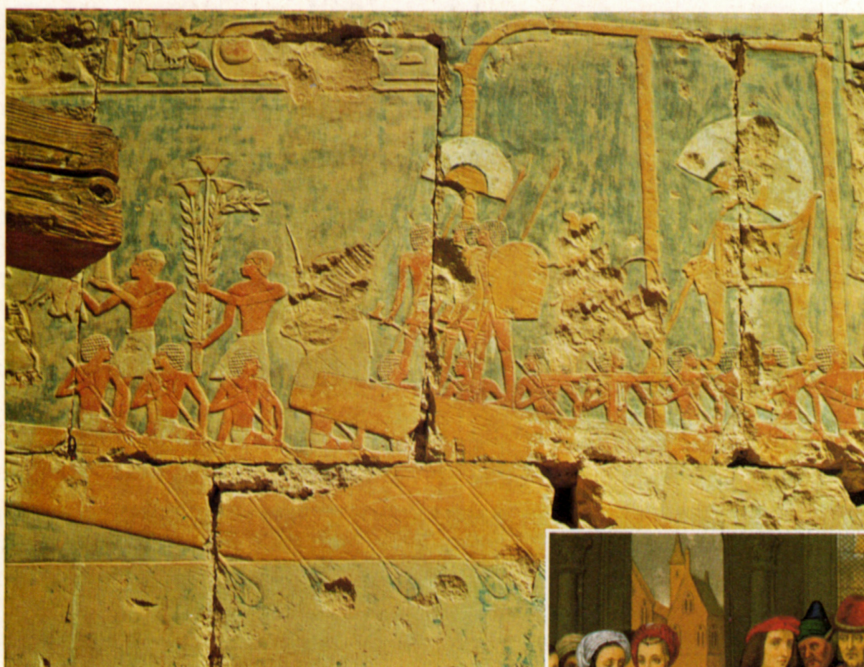
attempt to explain such mysteries as fossil dinosaurs. How had these species come to vanish? The answer, according to eminent scientists like Georges Cuvier (1769–1832), was that a series of violent catastrophes had wiped out these species, so nature had had to start from scratch again. Lyell's *Principles of geology* and Darwin's *Origin of species* destroyed the catastrophe theory by showing that our Earth is in fact thousands of millions of years old – not a few thousand, as had been assumed – and that the dinosaurs became extinct over a long period by the gradual process of natural selection.

Or *did* they? One of the unexplained facts of prehistory is that dinosaurs vanished quite suddenly – overnight, as it were. They had



lasted a hundred million years – compared to Man's two million – and yet they vanished in what was, geologically speaking, the twinkling of an eye. One theory is that their sudden disappearance was due to the explosion of a supernova – an exploding giant star – that bombarded the Earth with poisonous radiations.

But even if we rule out such a hypothesis, there are other ways in which the catastrophe could have occurred. No one can fully explain the great ice ages that have covered the Earth at intervals. Stranger still, some of these ice ages seem to have come on with awe-inspiring suddenness. In *Worlds in collision* Velikovsky wrote about the riddle of the mammoth found frozen in blocks of ice in Siberia in 1799 (page 944). He might have gone on to mention the Berezovka mammoth, discovered in Siberia around the turn of the century; the meat was still as edible as quick-frozen steak, and there were grasses



and fresh buttercups in its stomach. Velikovsky consulted a quick-freezing firm, who admitted that it would have no idea of how to go about freezing a whole mammoth so that the flesh remained edible after thousands of years. It takes 30 minutes to quick-freeze a mere side of beef. But a creature the size of a mammoth – covered with hair – could not be penetrated by cold in less than days, and the stomach would have had time to start decomposing. This had not happened in the case of the Berezovka mammoth. According to Velikovsky, some sudden catastrophe must have brought the temperature close to absolute zero, and kept it there, to freeze a mammoth through and through. One way in which this could have happened was for volcanoes to have shot out vast quantities of gas and dust into the atmosphere; howling gales would have built up cold fronts, causing huge clouds of icy snow. Such a freezing cloud, encountering a patch of still, warm air – in a protected valley – would descend literally like a ton of bricks. Any mammoths in the valley would be quick-frozen to death.

Cataclysmic evolution

It was ancient catastrophes that Velikovsky proceeded to study at Princeton, and the result was his most readable and fascinating book *Earth in upheaval*. In this book, published in 1955, we can glimpse some of the daring intuition that makes Velikovsky's thought so exciting to follow. After discussing Darwin's theory of evolution, he raises serious doubts about its adequacy, and suggests a theory of 'cataclysmic evolution', in which new species might appear by mutation of genes. At that time, every good biologist in the world was a Darwinian, and Velikovsky's 'cataclysmic evolution' was cited as evidence of his intellectual irresponsibility. Yet now biologists have come to recognise that

Darwin's theory of evolution is highly questionable. Immense biological changes *do* occur in sudden leaps. Geneticists are busy trying to understand the mechanism by which these occur, and they may find satisfactory explanations that do not require the hypothesis of outside intervention. Meanwhile, it is interesting to see that Velikovsky's heterodox theory begins to look more like a genuine scientific inspiration.

It was unfortunate for Velikovsky that, by the time *Earth in upheaval* appeared in 1956, the general public had largely lost interest in the controversy. By this time, he had published the first volume of his 'revised chronology of ancient history', *Ages in chaos* (1952), and most ordinary readers must have found this work confusing and boring – it is a



The wall paintings at Deir el-Bahri (above left) show the Egyptian Queen Hatshepsut's journey to the mysterious land of Punt. Velikovsky suggests that the paintings show the Queen on her way to Jerusalem to visit King Solomon – and that Hatshepsut was actually the Queen of Sheba (left, in an illustration from a 15th-century manuscript). Hatshepsut is believed to have lived some centuries before Solomon – but Velikovsky boldly argues that she actually lived some 600 years later than is assumed

Below: the head and leg of a young mammoth found in the Alaskan permafrost: Velikovsky believed that the sudden disappearance of the mammoths could be explained only by a catastrophe that caused a drastic drop in temperature



lengthy comparison of various dates in Egyptian and Jewish history, together with an attempt to show that historians have got it all wrong. Even for the intelligent layman, the question of whether Queen Hatshepsut of Egypt was the same person as the Queen of Sheba is scarcely a vital issue.

There was also the fact that *Worlds in collision* had been over-exposed. The mass onslaught on Velikovsky had given readers the impression that his theories had been totally discredited, while the titles of his books – *Worlds in collision*, *Ages in chaos*, *Earth in upheaval* – gave rise to the suspicion that he was a sensationalist. What happened can be compared to the events that followed the publication of *The third eye* by T. Lob-sang Rampa when its author was revealed to be an Englishman using a Tibetan pseudonym. Despite his assurances that he was actually the reincarnation of a Tibetan monk, only the faithful stayed around to listen to the sequel. Fortunately, in Velikovsky's case, the 'faithful' finally succeeded in having the whole affair reopened.

What was it that rekindled the Velikovsky controversy? See page 1226

Dear Sir,

After reading your recent articles on the Money Pit (issues 45, 47 and 48) I feel I must write and offer a more realistic explanation, which seems so obvious to me that I find it hard to believe it has not been put forward before. After all, who would dig a hole over 100 feet [30 metres] deep to bury treasure when it could have been hidden with half the effort? On Oak Island the water always came to within 30 feet [9 metres] of the surface – by making the hole and flood tunnels much shallower the same aim would have been achieved. Also who but an idiot would bury money in such a way that it would take a great deal of effort to retrieve it? But the builder certainly was no idiot.

I think that the important clues every one overlooked were the layers of coconut fibre and the layer of charcoal. The charcoal was situated about 8 feet [2.5 metres] below the water level and the layers of coconut fibre did not start until below this level. It seems to me that these were used as filters and the pit was built as an early attempt to get drinking water from sea water. As for the metal struck during the various drillings, it was probably some form of grating put across the flood tunnel.

The pit was certainly ingenious and the builder (or builders) too intelligent to have constructed it to hide treasure.

Yours faithfully,

Rory Moore

Atherstone, Warwickshire

Dear Sir,

May I refer to the paragraph on page 733 in the article about survival of death and point out that it is untrue that 'none' of the pacts made between persons to prove their continued existence after death (by giving the correct answer or solution to a prearranged question or problem) has been successful.

On 9 January 1929 Beatrice Houdini, the widow of the great magician, issued a sworn statement, which reads as follows:

Regardless of any statement made to the contrary, I wish to declare that the message, in its entirety, and in the agreed upon sequence, given to me by Arthur Ford, is the correct message pre-arranged between Mr Houdini and myself.

The statement was witnessed by H.R. Zander (United Press representative), Mrs M. Chester (lifelong friend of Houdini) and Mr J.W. Stafford (editor of *Scientific American*). This was no isolated success as some 40 years of investigation has proved to me.

One other small point (from page 730). I quote: 'For by ESP a human mind can . . . "pick the brains" of others. . . .' But what exactly does the medium 'pick' when he or she receives information unknown to the sitter – known only to a dead person – which on proper investigation proves to be right? It does happen – and not infrequently.

Yours faithfully,

R. Parker

Seaford, Sussex

Dear Sir,

I have always enjoyed reading the letters in *The Unexplained* but I never thought I would be writing

one – until last week. On Thursday, 27 August 1981 I was on my way to the village post office with my 10-year-old son. It was a lovely hot, sunny day and the time was about 11 a.m.

We had nearly reached the post office when my son said, 'What's that up there, Mum?' I looked up and gliding away across the sky almost directly above us was a round disc shape. I don't know whether the Sun was reflecting off it or whether it was flashing white lights, but it was shining very brightly – just like a mirror. I couldn't see any details, only the round shape, but one edge looked quite sharp against the sky as if it were the underneath of something.

It moved very slowly then seemed to stop and hover. By this time I was quite excited. Suddenly it started to change to an orange-red colour and began to pulsate. Then it turned completely red and, as we watched, I wondered why it seemed to be getting smaller – then realised it was in fact going straight up into the air at a terrific speed. I watched until it was just a speck of red, then it disappeared. But high in the sky, as far as I could see, I'm sure I could just make it out again as a small white disc.

Later that day I heard that a man thatching a roof had also seen it. I went to see him and he said he had never seen anything like it and that in his opinion it was definitely not an aeroplane or balloon.

Yours faithfully,

Beryl Hayward (Mrs)

King's Sutton, Oxon.

Dear Sir,

As a statistician I read with interest your article 'Against all the odds' in issue 31, but was disappointed that it contained the ever-recurring and gross misconception concerning monkeys and typewriters.

Not only would a whole army of monkeys never type out the complete works of Shakespeare, but they would never even produce the first three lines of a single one of his plays or poems.

Suppose, to simplify the calculations, that a typewriter has only 26 keys and the spacing between words is ignored, the chances of one particular letter being chosen are 1 in 26. The chances of this being followed by a particular second letter increase these odds to 1 in 26^2 and so on.

Thus the odds against any monkey managing to string together any given 10 letters of Shakespeare's work are an astronomical 26^{10} or 141,227,095,653,376 to 1!

Such an example implies that all 'coincidence' could be explained in terms of the laws of probability – something I don't believe to be true.

Yours faithfully,

John Carnell

Maldon, Essex

The odds against a monkey at a typewriter producing a work of Shakespeare certainly are enormous – thank you for pointing out just how unlikely this would be! But the fact that the odds against something happening are great is, of course, no argument for the impossibility of that event (see box on page 596); the odds are a measure of our surprise if the event occurs.

THE WORLD'S MYSTERIOUS PLACES

17 Monument Valley, Arizona

This broad valley lies in south-east Utah near the Arizona border. Towering hundreds of feet above an expanse of sand dunes and flat land are spectacular monoliths, buttes and escarpments, naturally formed in red sandstone that glows in the fierce light of day and at dusk.

18 Mesa Verde, Colorado

Mesa Verde National Park contains the most spectacular prehistoric cliff dwellings in the USA, the largest comprising some 200 rooms. The 'caves' were occupied by the Pueblo Indians from the 9th to the 13th centuries AD when, for some as yet unknown reason, they were deserted.

19 The standing stones at Stenness

Called the Ring of Brodgar, this immense stone circle is situated on the island of Mainland in the Orkneys. It stands on a raised circular platform of turf, surrounded by a moat and a grassy rampart. The ring originally comprised about 60 stones, but today only 27 remain erect.

20 The temples of Mnajdra, Malta

Standing on a remote spot overlooking the Mediterranean, the temples of Mnajdra form one of Malta's most impressive megalithic sites. Built of huge stone blocks over 4500 years ago, they consist of a complex system of interconnecting rooms and niches, which are remarkably well-preserved.

21 Statue menhirs at Filitosa

Corsica has 60 known statue menhirs, most of which are at Filitosa. Thought to be images of the dead, these stone masterpieces have been dated to the 15th or 14th century BC – immediately before the island was overrun by invaders, who broke up many of the figures for use as building materials.

22 Silbury Hill, England

The largest man-made mound in Europe, Silbury Hill in Wiltshire stands 130 feet (40 metres) high and its base covers an area of over 5 acres (2 hectares). No one knows why it was built, although popular theories range from a burial mound for the legendary King Sil to a gigantic sundial.

23 Umm-el-Jamal, Jordan

On an old caravan route in the desert of north-eastern Jordan stands the ancient Graeco-Roman city of Umm-el-Jamal. Once a thriving settlement, it was abandoned over 1000 years ago, and now appears on the horizon like a ghost town – its stone buildings intact, but totally deserted.

24 Loch Morar, Scotland

A lonely expanse of water stretching over 24 square miles (62 square kilometres), Loch Morar is traditionally the lair of Morag, a creature only seen whenever one of the clan Macdonell is about to die. Despite many explorations, no evidence of any such monster has been found.